

GSM1304E

20V N-Channel Enhancement Mode MOSFET

Product Description

GSM1304E, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

These devices are particularly suited for low voltage power management, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

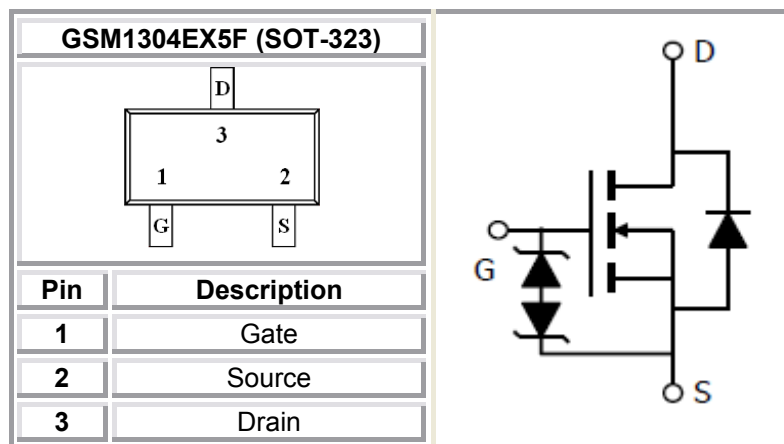
Features

- 20V/1.8A , $R_{DS(ON)}= 320m\Omega@V_{GS}=4.5V$
- 20V/1.5A , $R_{DS(ON)}= 450m\Omega@V_{GS}=2.5V$
- 20V/1.2A , $R_{DS(ON)}= 580m\Omega@V_{GS}=1.8V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- ESD Protected
- SOT-323(SC-70) package design

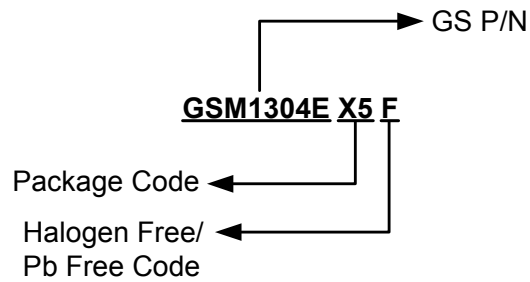
Applications

- Net Working System
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories
- Battery Operated Systems
- Power Supply Converter Circuits
- Load/Power Switching Smart Phones, Pagers

Packages & Pin Assignments

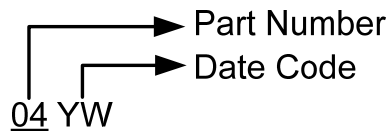


Ordering Information



Part Number	Package	Quantity
GSM1304EX5F	SOT-323	3000 PCS

Marking Information



Absolute Maximum Ratings

T_A=25°C Unless otherwise noted

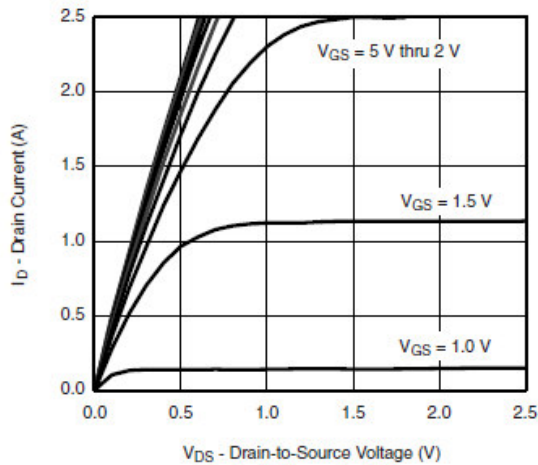
Symbol	Parameter	Typical	Unit
V _{DSS}	Drain-Source Voltage	20	V
V _{GSS}	Gate-Source Voltage	±12	V
I _D	Continuous Drain Current(T _J =150°C)	T _A =25°C	1.8
		T _A =70°C	1.2
I _{DM}	Pulsed Drain Current	6	A
I _S	Continuous Source Current(Diode Conduction)	1	A
P _D	Power Dissipation	T _A =25°C	0.35
		T _A =70°C	0.22
T _J	Operating Junction Temperature	150	°C
T _{STG}	Storage Temperature Range	-55/150	°C
R _{θJA}	Thermal Resistance-Junction to Ambient	120	°C/ W

Electrical Characteristics

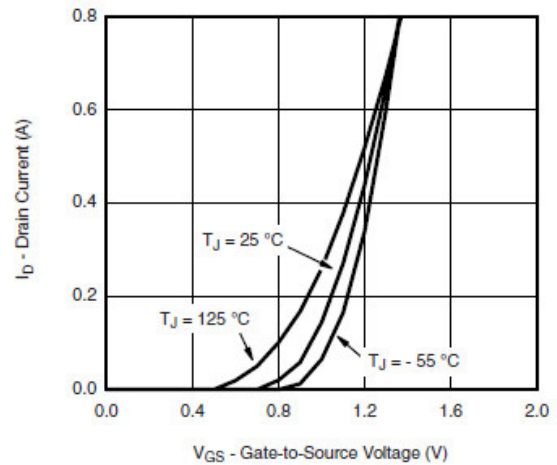
T_A=25°C unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	20			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.3		0.8	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±12V			±1	mA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 16V, V _{GS} =0V			1	μA
		V _{DS} = 16V, V _{GS} =0V, T _J =85°C			5	
I _{D(on)}	On-State Drain Current	V _{DS} ≥ 5V, V _{GS} =4.5V	1.8			A
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =4.5V, I _D =1.8A		290	320	mΩ
		V _{GS} =2.5V, I _D =1.5A		400	450	
		V _{GS} =1.8V, I _D =1.2A		500	580	
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =1.0A		1		S
V _{SD}	Diode Forward Voltage	I _S =1.0A, V _{GS} =0V		0.65	1.2	V
Dynamic						
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1MHz		70		pF
C _{oss}	Output Capacitance			20		
C _{rss}	Reverse Transfer Capacitance			8		
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _D =1.2A		1.06	1.38	nC
Q _{gs}	Gate-Source Charge			0.18		
Q _{gd}	Gate-Drain Charge			0.32		
t _{d(on)}	Turn-On Time	V _{DD} =10V, R _L =20Ω, I _D =1.2A, V _{GEN} =4.5V, R _G =1Ω		18	26	ns
t _r				20	28	
t _{d(off)}	Turn-Off Time			70	110	
t _f				25	40	

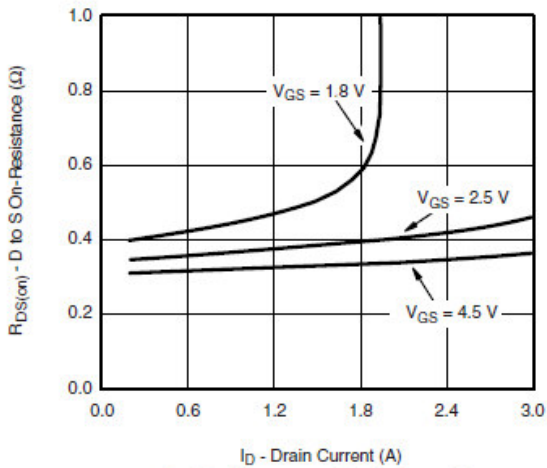
Typical Performance Characteristics



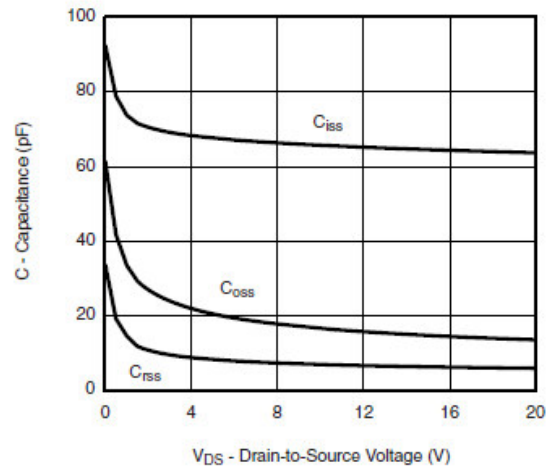
Output Characteristics



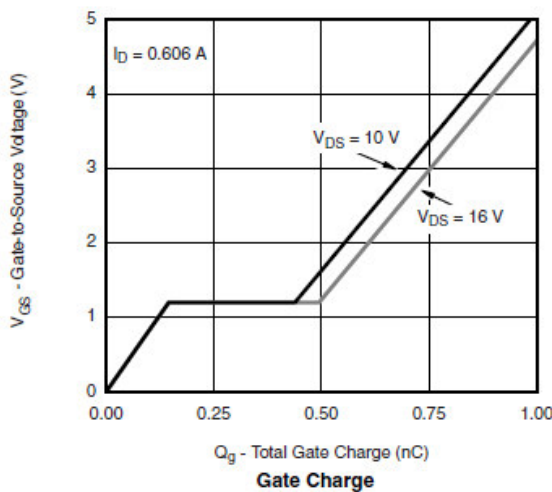
Transfer Characteristics



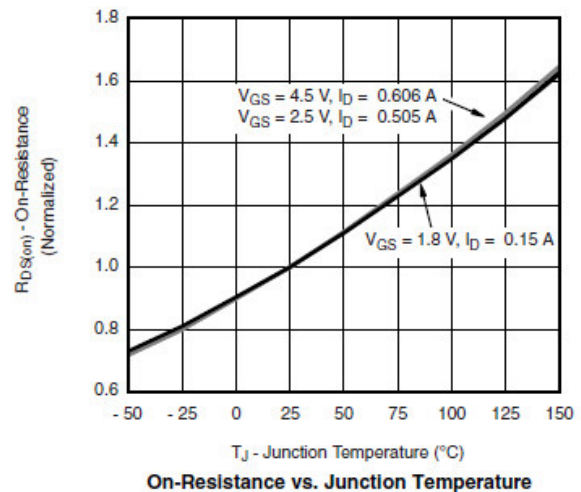
On-Resistance vs. Drain Current



Capacitance

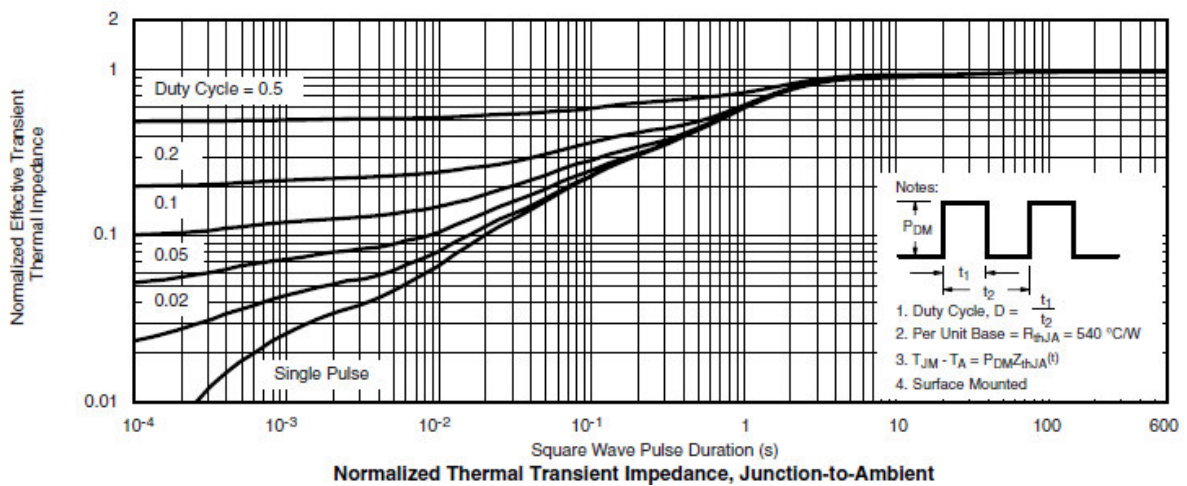
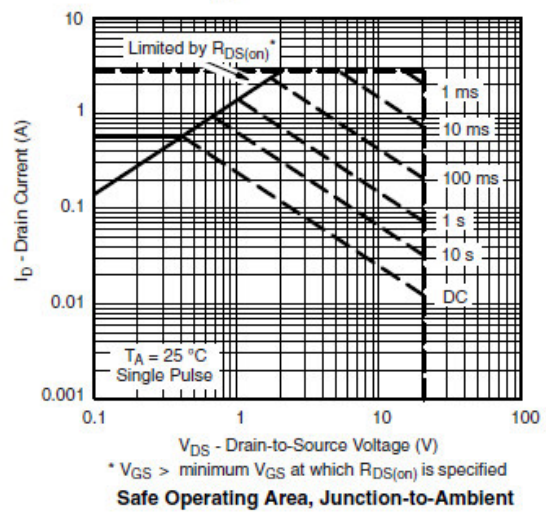
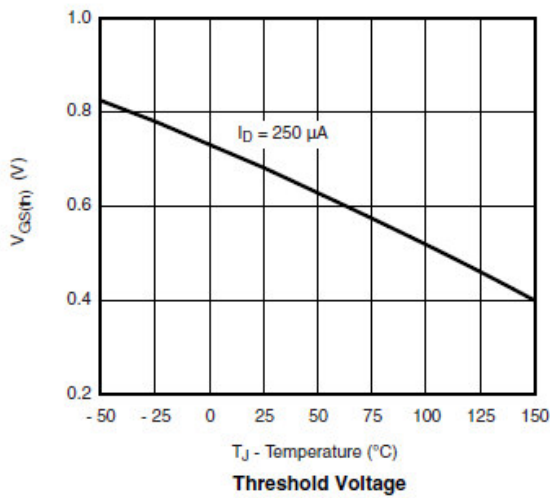
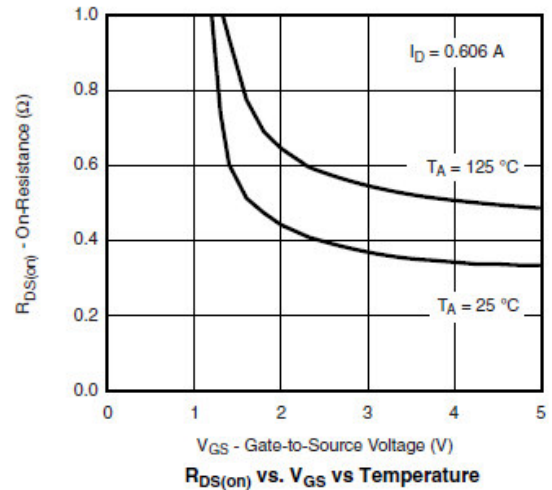
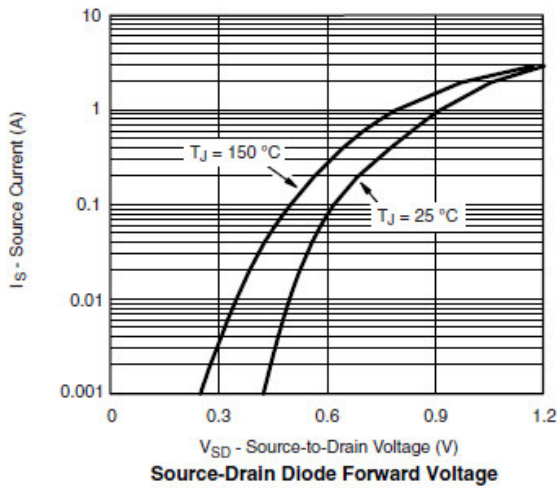


Gate Charge



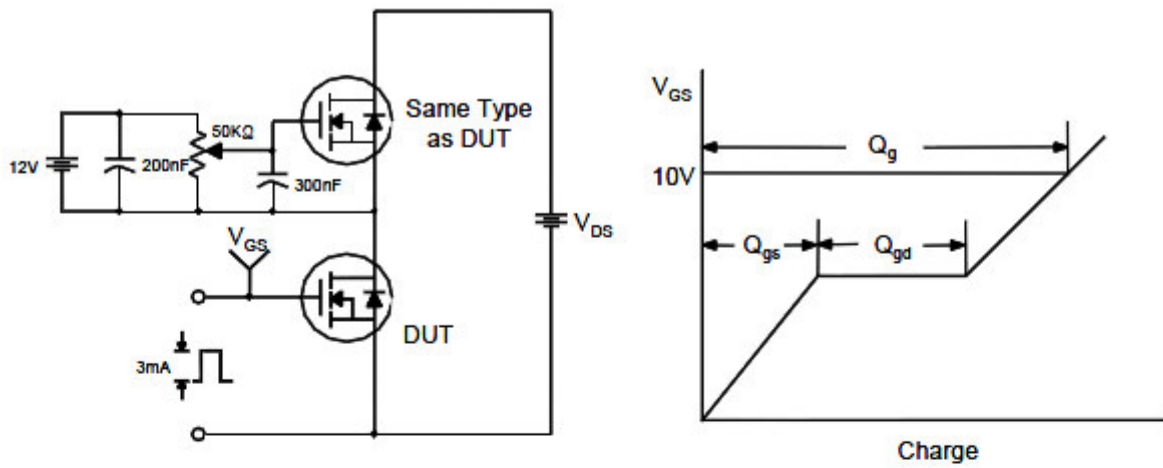
On-Resistance vs. Junction Temperature

Typical Performance Characteristics (continue)

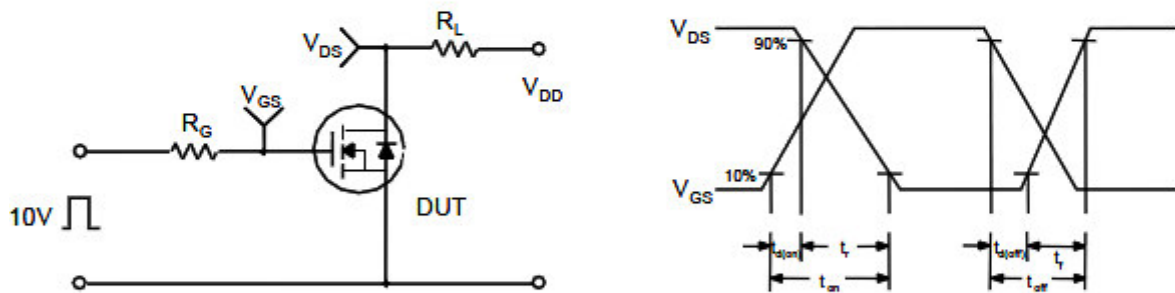


Typical Characteristics

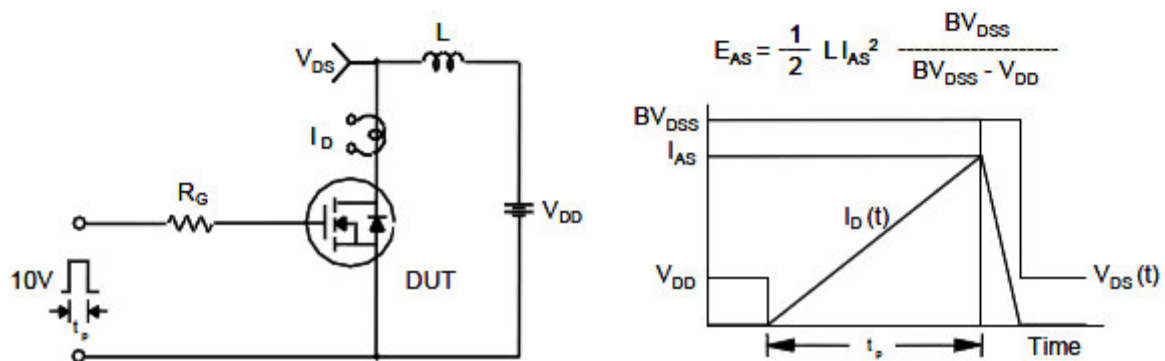
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

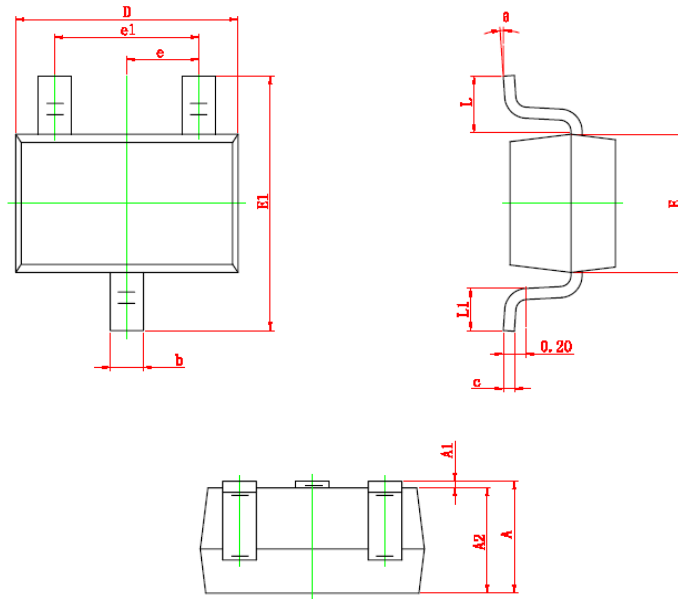


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

SOT-323 PLASTIC PACKAGE







Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°



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